ARIZONA DEPARTMENT OF TRANSPORTATION
INTERMODAL TRANSPORTATION DIVISION
ENGINEERING CONSULTANTS SECTION
205 South 17th Avenue - Room 293E, Mail Drop 616E
Phoenix, Arizona 85007

Arizona Governor's Award for Quality
1995 Pioneer Award Recipient

November 9, 1998

Engineering Consultants Section

INFORMATION BULLETIN 98-24

TO: Consultants

FROM: Engineering Consultants Section

SUBJECT: Roadway Design Changes

Attached are four office memos from the ADOT Roadway Design Section concerning changes in design criteria and construction standards that are to be implemented on ADOT roadway design projects. The memos address the following topics:

1. **Breakaway Cable Terminals (BCTs), Treatment of Existing BCTs on ADOT Projects**

2. **FLEAT 350 Guard Rail End Terminal**

3. **Revisions to Construction Standards-English Version** Copies of the revised Standards can be obtained from ADOT Engineering Records at 1655 W. Jackson, Phoenix AZ, phone 255-8216.

4. **New Barrier Summary Sheet** The sheet can be obtained from the ADOT Roadway Design Section and will soon be available on the Internet via the ADOT Web Page.

If there are any questions please call Terry Otterness, Design Program Manager at (602) 255-7341.

ARIZONA DEPARTMENT OF TRANSPORTATION
ROADWAY ENGINEERING GROUP
OFFICE MEMO

October 2, 1998

TO: Roadway Design Personnel
ADOT and Consultants

FROM: Terry H. Otterness THO
Design Program Manager
Roadway Design Section

RE: **Breakaway Cable Terminals (BCTs)**
Treatment of Existing BCTs on ADOT Projects

In conjunction with the FHWA Policy of utilizing only NCHRP 350 crash tested and approved guard rail end terminals effective October 1, 1998, the FHWA has issued an amendment stating that "BCTs should now be replaced with end treatments meeting NCHRP Report 350 criteria in conjunction with 3R work". This Policy was issued for projects on the National Highway System (NHS), however, there appears to be no rationale for applying the policy only on the NHS.

ADOT has elected to comply with the amendment recommendations and therefore we will need to change out BCTs on 3R type projects. 3R projects include primarily reconstruction projects, widening, and pavement preservation projects. Other minor projects which impact existing guard rails within the project limits should include the upgrades. Minor projects which are spot improvements that do not impact guard rail such as fencing, signing, striping, drainage, or other maintenance type projects, including seal coats and overlays one inch or less in thickness will **not** be required to upgrade BCTs.

EXCEPTION: There is one exception to replacement of BCTs on 3R Projects. **Where operating speeds are anticipated to be 30mph or less and reconstruction of the guard rail is not required, existing BCTs may remain in place.**

Please implement these modifications as needed on your ongoing projects in accordance with the above guidelines. Please incorporate these changes into projects advertised after October 1, 1998. The BCTs should be replaced with current NCHRP 350 approved guard rail end treatment alternates specified by Roadway Design Section. Please call us at 255-7341 if we can be of assistance.

Please distribute this memo within your Groups to Project Managers and designers.

c. Roadway Design:Valley Freeway Group:Maintenance Group: Eng. Consultants; Statewide Project Mgmt: Local Government; Bridge Group; Contracts & Specs; Traffic Engineering; Construction Group; Districts; Materials Group; FHWA; Tom Schmitt; Wayne Collins

ARIZONA DEPARTMENT OF TRANSPORTATION
ROADWAY ENGINEERING GROUP
OFFICE MEMO

October 6, 1998

TO: Roadway Design Personnel
ADOT and Consultants

FROM: Terry H. Otterness THO
Design Program Manager
Roadway Design Section

RE: **Fleat 350 Guard Rail End Terminal**

The FLEAT 350 (Flared Energy Absorbing Terminal) is a flared guard rail end terminal meeting NCHRP Report 350 Test Level 3 crash test criteria. This proprietary terminal has been reviewed and approved for use by the ADOT Traffic Product Evaluation Committee and the Maintenance Product Evaluation Committee. The FLEAT 350 is a 37.5' long straight flared system consisting of an impact head which sequentially kinks the standard w-beam rail, a cable anchor and box assembly, wood posts and blocks, steel foundation tubes and a ground strut.

A Detail showing the Layout for FLEAT 350 is attached and should be included in the plans. Note that the straight flare shows an offset of either 2.5' or 4': the 2.5' flare will be normal design offset and should be adequate for most applications. This is especially true when Type B guardrail is used (see General Note 3). Offsets greater than 2.5' and up to 4' may be specified on the plans if District requests additional offset for snow plowing or if determined by specific site conditions. Stored Specifications for the FLEAT 350 have been prepared by Contracts and Specifications Services and are available upon request.

The FLEAT 350 is a product of Road Systems, Inc. of Frankfort, Illinois and is available through multiple sources. John Durkos of Road Systems may be reached at 815-464-5917.

Copies of the Approved Manufacturer's Drawings, Installation Instructions Booklet, and supplemental information are being sent to the Districts. Additional copies for designers may be obtained by contacting Tom Scheck at 255-8674.

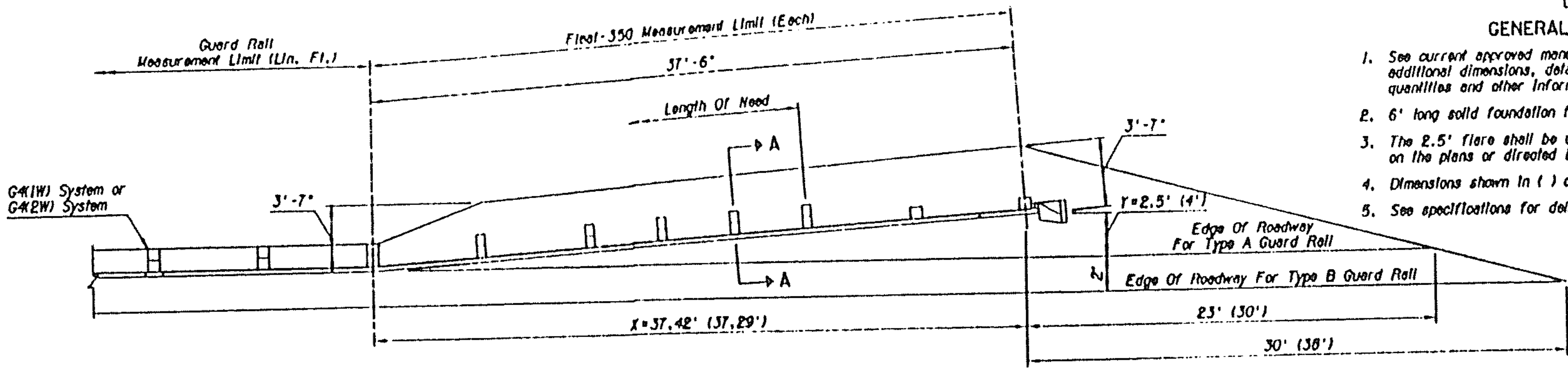
The FLEAT 350 should be selected by the designer and shown on the plans as an alternate for locations where flared guard rail terminals are desired. Presently, the FLEAT 350 and the SRT 350 will be shown as bid alternates on the Barrier Summary Sheet. The Barrier Summary Sheet has been modified to accommodate this option. Flared guard rail terminals will normally be specified when there are shoulders less than 6' in width and where Districts desire flared guard rail terminals in snow plowing areas.

In-house design personnel can obtain the Cadd Detail and Barrier Summary Sheet through the Cadd Support Team.

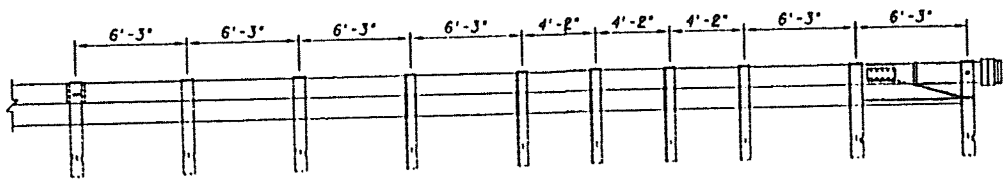
F.H.W.A. REGION	STATE	PROJECT NO.	SHEET NO.	TOTAL SHEETS	AS BUILT
9	ARIZ.				

GENERAL NOTES

1. See current approved manufacturer's drawings for additional dimensions, details, hardware, hardware quantities and other information.
2. 6' long solid foundation tubes shall be used.
3. The 2.5' flare shall be used unless otherwise shown on the plans or directed by engineer.
4. Dimensions shown in ( ) correspond to 4' flare.
5. See specifications for delineation of the FLEAT-350.



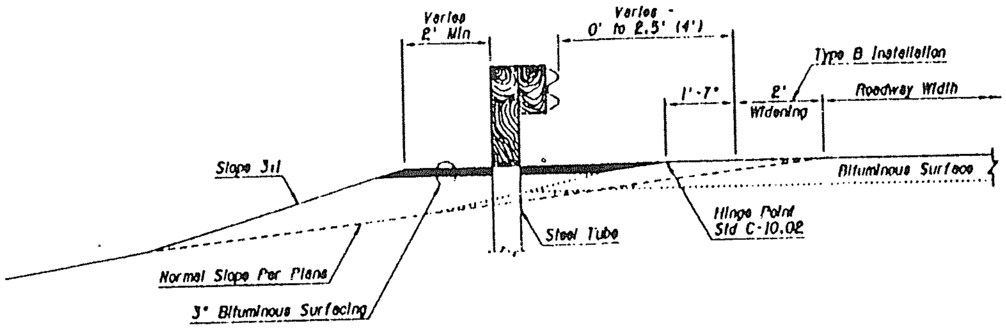
PLAN



ELEVATION

Dst Along 37'6" Flare	Dst Along X Axis		Dst Along Y Axis To Face Of Guard Rail	
	2.5' Flare	4' Flare	2.5' Flare	4' Flare
6'-3"	6.24'	6.21'	0.42'	0.67'
12'-6"	12.47'	12.43'	0.83'	1.33'
16'-8"	16.63'	16.57'	1.11'	1.78'
20'-10"	20.79'	20.71'	1.39'	2.22'
25'	24.94'	24.86'	1.67'	2.67'
31'-3"	31.18'	31.07'	2.08'	3.33'
37'-6"	37.42'	37.29'	2.5'	4'

STRAIGHT FLARE GEOMETRICS



SECTION A-A

DETAIL

LAYOUT FOR FLEAT-350

ARIZONA DEPARTMENT OF TRANSPORTATION
INTERMODAL TRANSPORTATION DIVISION
ROADWAY DESIGN SECTION

PRELIMINARY NOT FOR CONSTRUCTION OR RECORDING

TRACS NO.

OF

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8-OCT-1998 09:13

VIEW NAME:

ARIZONA DEPARTMEN OF TRANSPORTATION
ROADWAY ENGINEERING GROUP
OFFICE MEMO

October 13, 1998

TO: All Users of Construction Standards

FROM: THO Terry H. Otterness, Design Program Manager, Roadway Engineering Group

RE. Revisions to Construction Standards - English Version

Several changes are being made to the Construction Standard Drawings and the Construction Standards Index.

The revised Standards C-05.20, C-05.50, C-06.10, C-07.01 (Sheet 1 of 2), C-07.04, C-07.05, C-07.10, C-10.22, C-10.31 (Sheet 2 of 3), C-10.66, C-13.10, C-13.15, C-13.25, C13.30, C-13.60 contain minor modifications. A new detail for single curb joints and a note on B joints were added to Standard C-07.01 (Sheet 2 of 2). In Standards C-10.21, C-10.30, C-10.31 (Sheet 3 of 3) and C-10.32, steel block was replaced by wood block to comply with NCHRP Report 350 test requirements. Standards C-10.40, C-10.41 and C-10.44 are deleted since we are now utilizing manufacturer's approved drawings for hardware details.

Standard C-10.45, reflects a replacement of concrete footings with steel tubes. In Standard C-10.62, New Jersey barrier was changed to Type F configuration and a lower steel reinforcement was added.

Design Personnel should review the revised drawings and incorporate into their design plans as appropriate. The updated 1A sheet (List of Standards) is available at the Roadway Support Desk 255-8667 or 8671. Also, please support any requests from field to implement changes on current construction projects.

Please distribute to all users within your Group or District. Additional copies may be obtained from ADOT Engineering Records at 255-8216. Questions regarding the Drawings may be directed to Tom Scheck (255-8674), Jeri Kasemsant (255-7735) or me (255-7341).

c:

Roadway Group	Statewide Project Mgmt. Group
Valley Freeway Group	Traffic Group
Bridge Group	Contracts & Specifications Section
Construction Group	Central Maintenance Group
Local Government Section	Districts (10)
FHWA	Engineering Consultant Services

ARIZONA DEPARTMENT OF TRANSPORTATION
ROADWAY ENGINEERING GROUP
OFFICE MEMO

October 22, 1998

TO: Roadway Design Personnel
ADOT and Consultants

FROM: Terry H. Otterness THO
Design Program Manager
Roadway Design Section

RE: **New Barrier Summary Sheet**

A new Barrier Summary Sheet has been developed which can be utilized for all types of projects. Previously, the Barrier Summary was available for use in formats to fit at least three types of projects.. The consensus of the team that developed the new summary sheet was to revert to the "direction of stationing" convention rather than continue with the "direction of traffic" basis. This is reflected in the attached sheet. Please take the time to familiarize yourself with the format of the new sheet: refer any questions you may have to your Roadway Design Section contacts at 602-255-7341.

The new summary sheet will be available soon via the ADOT Web Page on the Internet as follows: **http://www.dot.state.az.us/roads/cae/standard.html**. Contact the Cadd Support Team if your project needs more immediate attention.

Please implement the new summary sheet on new design projects and on underway projects when reasonable to do so without significant rework.

attachment

c.
Roadway Engineering Group
Statewide Project Management
Valley Freeway Group
Local Government
Engineering Consultant Services
Districts (10)
FHWA
Contracts and Specifications Section
Bridge Group